Remarks

Applicant submits this response after the final Office Action with a Request for Continued Examination (RCE). At the time of the final Office Action, claims 1-22 and 24-42 were pending in the application, and claims 1-21 were rejected. By this Amendment, claims 1-2, 14, and 16 have been amended to provide greater clarity; and claims 15 and 20-21 have been cancelled to expedite the prosecution. Support for the claim amendments are found in the specification as originally filed, particularly at line 22 on page 7 to line 3 on page 8, and line 22 on page 12 to line 3 on page 13. No new matter is introduced by this Amendment. Favorable reconsideration is solicited in light of the claims amendments and following remarks.

Remarks Directed to Claim Objections

Claim 1 is objected to due to grammatical informality as stated on page 3 of the Office Action. In response, Claim 1 has been amended to read "A method of obtaining active recombinant Con A expressed in a bacterial host cell." As amended, claim 1 is believed to have been provided with greater clarity. Claim 21 is objected to due to improper antecedent basis. Without waiver or acquiescence to the Examiner's objections, Applicant has cancelled claims 20-21. Reconsideration and withdrawal of these objections is solicited.

Remarks Directed to Rejections of Claims 15-19 Under 35 U.S.C. § 112, Second Paragraph

Claims 15-19 are rejected due to insufficient antecedent basis with respect to the term "non-plant host cells." Without waiver or acquiescence to the Examiner's rejections, Applicant has cancelled claim 15 and amended claims 16-19 to replace the term "non-plant host cells" with "the bacterial host cell." Sufficient antecedent basis is thus believed to have been provided to claims 16-19. Rejections of claims 20-21 under this section is moot as they have been cancelled. Reconsideration and withdrawal of these rejections is solicited.

Remarks Directed to Rejections to Claims 2-13
Under 35 U.S.C. § 112, Second Paragraph

Claims 2-13 are deemed indefinite because "it is unclear whether the buffer contains soluble glycogen and insoluble Con A" (page 4 of the Office Action). Without waiver or acquiescence to the Examiner's rejections, Applicant has amended claim 2 to recite a method of claim 1 comprising adding a buffer to the lysate, wherein said buffer has properties that glycogen originating from the bacterial host cell is soluble in the buffer, whereas Concanavalin A (Con A) originating from the bacterial host cell is insoluble in the buffer. With this amendment, it is clear that soluble glycogen and insoluble Con A are not contained within the buffer as provided. Indeed, the Examiner has stated on page 4 of the Office Action that interpretation on the contrary would not make any sense. With this amendment, claims 2-13 are believed to have been provided with greater clarity. Reconsideration and withdrawal of these rejections is solicited.

Remarks Directed to Rejections of Claims 1-4, 14-16 and 20-21
Under 35 U.S.C. § 102(b) Over Min et al. (EMBO J., 1992, 11(4): 1303-1307); hereinafter Min

Independent claim 1 recites a method of obtaining recombinant mature Con A in a bacterial host cell comprising (a) expressing said recombinant Con A in a bacterial host cell; (b) producing a lysate containing said Con A, wherein the insoluble fraction of said lysate has a reduced glycogen content; and (c) recovering said Con A.

In rejecting the independent claim 1 and claims 2-4, 14-16, and 20-21 dependent therefrom, the Examiner opines that *Min* teaches the expression of active recombinant pro-Con A in E.coli cultured in M9 medium, that the cultures were centrifuged and then lysed; the Protein Con A appeared in the pellet and was thus removed from the lysate; that glycogen-Con A complex is thus removed because active Con A forms a complex with glycogen according to Applicant's remarks; and that the glycogen content of the cell lysate is reduced accordingly (Office Action, pages 5-6). For at least the reasons set forth below, Applicant respectfully traverses.

Anticipation has been held to be one of strict identity. The reference must expressly or implicitly teach every claimed limitation as recited in the subject claim(s). The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

Min fails to teach or suggest the claimed invention for many reasons. As stated in paragraph 7 of David Hugh Jones' Declaration submitted herewith, *Min* does not recognize the problems associated with glycogen or more particularly glycogen complexes with recombinant mature Con A proteins and thereafter negatively affects Con A; *Min* makes no mention of the issues surrounding the purification of Con A in relation to glycogen, and does not demonstrate the recovered protein product is substantially free of glycogen and other impurities; and that removing glycogen from active Con A - glycogen complexes in the insoluble fraction of the lysate by releasing glycogen into the soluble fraction of the lysate is the specific solution provided only by the claimed invention.

The Examiner admits that *Min* merely teaches the expression of active recombinant Pro-Con A (Office Action, page 5). In fact, *Min* mainly concerns the effect of pro-Con A glycosylation on the protein maturation process leading to the ultimate mature Con A. The assertion "even though the Con A [in *Min*] is pro-Con A, said protein clearly is active" as stated on page 6 of the Office Action is misplaced. Applicant's claim 1 recites a method of obtaining recombinant mature Con A but not pro-Con A whether or not active. As stated in paragraph 8 of the David Hugh Jones' Declaration, *Min* is directed to recombinant pro-Con A, which is fundamentally different from the recombinant mature Con A recited in the claimed invention.

Further, and contrary to the Examiner's assertions, *Min* does not teach or suggest producing a lysate containing Con A, having a reduced glycogen content in the insoluble fraction of the lysate. In *Min*, cell lysates containing *de novo* soluble products or products solubilized from pelleted cell debris by denaturant were passed down through sephadex columns for recovery of the pro-Con A proteins.

The Examiner appears to have based the rejections citing for support the use of centrifugation in *Min*. The centrifugation steps were employed in *Min* simply to separate the cellular lysate from the pelleted cell debris and further to separate refolded aggregated product from the cell debris (page 1306). *Min*'s use of centrifugation does not reduce glycogen content in the insoluble fraction of the lysate, but merely, as conventionally known, separates the insoluble fraction (the pellet fraction) from the soluble fraction (the supernatant fraction) in the lysate. As stated in paragraph 10 and Table I of the David Hugh Jones' Declaration, the contaminant levels with particular reference to glycogen levels of a Con A sample according to *Min*'s method are significantly higher than the contaminant levels of a counterpart Con A sample according to the Applicant's method.

It is also worth noting that glycogen complexes with recombinant mature Con A and affects Con A recovery is what Applicant has discovered, but not what is known in the art. It is impermissible for the Examiner, after learning what Applicant has invented, to apply that learning (here Con A complexes glycogen) to cure *Min's* deficiencies in rendering Applicant's claims anticipated or obvious.

For at least the reasons set forth above, the independent claim 1 and all the claims dependent therefrom are submitted to be patentable.

Claim 2 is submitted to be patentable further due to the additional features that claim 2 recites - the method of claim 1 further comprising adding a buffer to the lysate, wherein said buffer has properties that glycogen originating from the bacterial host cell is soluble in the buffer, whereas Con A originating from the bacterial host cell is insoluble in the buffer.

Min does not teach the step of adding the buffer of claim 2 (page 1306). *Min* teaches that culture cells were resuspended in MOPS-metals buffer, fractioned via centrifugation, and cell lysate fractions were checked for the presence of soluble recombinant pro-Con A proteins. The pelleted cell debris after the centrifugation was resuspended, denatured, solubilized, and solubilized lysates were also subject to protein expression detections. Contrary to the assertions stated on page 6 of the Office Action, nowhere in *Min* does there exist any

teaching of a buffer which renders pro-Con A insoluble and glycogen soluble as required in claim 2. Therefore, the buffer in *Min* such as the MOPS-metals buffer solubilizes pro-Con A, but not to render pro-Con A insoluble, much less to render pro-Con A insoluble while rendering glycogen soluble.

The Examiner deems pro-Con A protein insoluble in *Min* citing as support "the fact that glycogen complexes to it." (Office Action, page 6). As stated herein elsewhere, glycogen complexes recombinant Con A protein is not "the fact" expressly stated and known in the art.

Claim 4 is submitted to be patentable further due to additional features claim 4 recites – the method of claim 2 wherein the buffer is a low ionic strength buffer ($I<0.3$) with a pH between 8.5 and 9.5. *Min* does not teach or suggest the buffer of claim 4. In fact, the MOPS-metals buffer employed in *Min* has a pH value of 7.0, a neutral pH as opposed to the basic pH of between 8.5 and 9.5 as required of the buffer of claim 4. Furthermore, this MOPS-metals buffer employed in *Min* contains 1 M NaCl (page 1306) resulting in a high ionic strength ($I>1.0$) as opposed to the low ionic strength ($I<0.3$) required of the buffer of claim 4.

Claims 5-13 appear to have only been rejected under 35 U.S.C. § 112 due to their dependency to claim 2. The Examiner has properly deemed no prior art rejections applicable to claims 5-13. Applicant submits claims 5-13 are patentable in light of the instant amendment to claim 2 which is now believed in allowable form and respectfully requests a notice to that effect.

Claim 17 is submitted to be patentable further due to additional features claim 17 recites – a method of claim 1 wherein *Escherichia coli* cells as the bacterial host cells are incapable of producing glycogen due to defects or mutations in genes for glycogen synthesis. *Min*, in contrast, does not teach the use of these *Escherichia coli* cells having deficient glycogen synthesis as recited in claim 17. In fact, *Min* is completely silent as to "glycogen," much less the synthesis of glycogen or genetic manipulation of glycogen synthesis.

Claim 18 is submitted to be patentable further due to additional features claim 18 recites – the method of claim 1 wherein the bacterial host cells have been cultured in the absence of an assimilable carbohydrate or carbon source that may be accumulated as glycogen. In contrast, *Min* teaches the use of M9 medium having a substantial amount of carbon source, such as glucose at a concentration of 4 mg/ml (page 1306). Clearly, nowhere in *Min* is there a teaching as to culturing the *E.coli* cells in the absence of a carbohydrate or carbon source as required in claim 18.

Conclusion

For the foregoing reasons, Applicant believes that the final Office Action mailed January 22, 2009 has been fully responded to. Consequently, in view of the above amendments and remarks, Applicant respectfully submits that the application is in condition for allowance, which allowance is respectfully requested.

The Examiner is requested to telephone Applicant's attorney if it would advance the prosecution of this application.

The Petition fee of $130.00 is being charged to Deposit Account No. 02-3978 via electronic authorization submitted concurrently herewith. The Commissioner is hereby authorized to charge any additional fees or credit any overpayments as a result of the filing of this paper to Deposit Account No. 02-3978.

Respectfully submitted,

DAVID HUGH JONES

By /Junqi Hang/
Junqi Hang
Reg. No. 54,615
Attorney for Applicant

Date: May 21, 2009

BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400
Fax: 248-358-3351